Updated: 12/27/2016

Data Notes: Public Community Water System Data Display

Vermont Environmental Public Health Tracking (EPHT)

Sections:

Disclaimer:

The data in this display are for public information only. The data are not meant to show whether or not a public water system is in compliance with drinking water regulations and standards. The "Maximum Contaminant Level (MCL)," which is set by the EPA as the highest level of a chemical allowed in drinking water, is used as a point of reference. Comparing the water system test data shown in this display with the MCL for that analyte does not necessarily mean a water system is in compliance or not in compliance with federal and state drinking water regulations. Information on the regulation of Vermont public drinking water systems is found on the **Vermont Department of Environmental Conservation Water Quality Monitoring website**. Information on national regulation of public water systems is found on the **US Environmental Protection Agency's webpage on drinking water contaminants**.

Some Public Community Water Systems (PCWS) purchase water from other systems. For purposes of calculating means and maxima displayed in this portal, analytical sample results of the water seller, excluding those for the two disinfection byproducts (TTHM and HAA5), are generally assigned to the water purchaser. In the case of the Champlain Water District (CWD) sample results for all ten contaminants (including TTHM and HAA5) are assigned to the PCWS that purchase directly from CWD.

Background:

Public Community Water Systems (PCWS) are water systems that serve at least 15 connections or serve 25 or more people. All water systems that fit this designation are tested for bacterial, chemical and radiological contaminants on a regular basis.

The data on this display are limited to Vermont public community water systems that serve at least 500 people (about 100 systems). Mean concentration data for ten contaminants are included for the years 1999 through 2015.

The U.S. Environmental Protection Agency and the states regulate more than 90 contaminants in public drinking water. The 10 contaminants displayed in this portal are Nationally Consistent Data Measures (NCDMs) that were selected by the National Environmental Public Health

Tracking Program's Content Working Group, and were chosen for their relevance to human health in the United States. Descriptions of each of the contaminants can be found at the bottom of this document.

Notes on Data Presentation:

- * = No data for selected year in water system. This usually means that no testing was required that year for the system.
- '0' in the "Mean Concentration Value" and "Maximum Concentration Value" columns indicates that all tests for that year were non-detects (i.e. no contaminant detected). Detection limits may vary depending on analyte tested, the year of the test, and the laboratory where the sample was tested.
- When a system has non-detect and detect samples in a given year, sample means are calculated using one-half of the detection limit for each non-detect value. This is done in accordance with Centers for Disease Control & Prevention (CDC) nationally-consistent data measures (NCDMs) for Environmental Public Health Tracking.

Data Sources:

The data used in this portal were developed from water quality data stored in state Safe Drinking Water Act (SDWA) databases such as the Safe Drinking Water Information System (SDWIS). Data were cleaned and transformed to an annual, aggregated format. Drinking water samples are usually taken at entry points to the water distribution system or at representative sampling points after treatment. The frequency of sampling for contaminants is determined by federal and state water quality regulations. When no reported sampling occurred in the selected year in a particular water system, the concentration values on the table will be populated with an asterix ('*'), and no point for that system will be shown on the map.

The geographic locations of the points used in the data display map to represent Public Community Water Systems (PCWS) are taken from the following sources, in order of preference (some water systems do not have the most preferable source for a point available):

1) Centroid of the PCWS service area polygon.

2) Generalized location of the PCWS office address.

3) Centroid point of the primary town served by the PCWS.

Service Area polygons for Public Community Water Systems (PCWS) used in the map were developed from multiple sources. Physical and digital water supply maps were obtained through maps requested from the VT Department of Environmental Conservation (DEC) Water Supply Division and Regional Planning Commissions (RPCs) in the state. Service addresses were also requested from PCWSs and were geocoded using E-911 address lists. Existing maps were used in conjunction with geocoded address lists to create the PCWS service area geography polygons used in the data display map.

Other layers used in the PCWS data display map are available in the data warehouse of the Vermont Center for Geographic Information website.

Some PCWS purchase water from other systems. For purpose of calculating the means and maxima displayed in this portal, analytical sample results of the water seller, excluding those for the two disinfection byproducts (TTHM and HAA5), are generally assigned to the water purchaser. PCWS who purchase water and are assigned the seller's sample results sometimes perform additional sampling of their own.

In the case of the Champlain Water District (CWD), sample results for all ten contaminants (including TTHM and HAA5) are assigned to the PCWS that purchase directly from CWD.

PCWS systems who purchase water from CWD are:

PCWS ID	**PCWS Name**
VT0005058	COLCHESTER FIRE DISTRICT 1
VT0005060	COLCHESTER FIRE DISTRICT 3
VT0005065	ESSEX TOWN WATER SYSTEM
VT0005066	ESSEX JCT WATER DEPT
VT0005077	VILLAGE OF JERICHO WATER SYSTEM
VT0005079	MILTON WATER DEPT
VT0005087	SHELBURNE WATER DEPT
VT0005091	SOUTH BURLINGTON CITY WATER SYSTEM
VT0005098	WILLISTON WATER DEPT
VT0005102	WINOOSKI WATER DEPT
VT0020333	MALLETTS BAY WATER CO

Other cases exist where the seller's analytical results are not assigned to the purchaser due to unavailability of that data. Examples include the Barre Town Water System, which purchases from multiple suppliers, and a few PCWS near the Vermont border that purchase water from out-of-state suppliers.

Definitions:

MCL (Maximum Contaminant Level): This is the highest level of a contaminant that is allowed in drinking water. This is a federal standard, set by the U.S. Environmental Protection Agency (EPA). The MCL is set as close as feasibly possible to the point at which there is no known or expected risk to health, using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

Vermont State Drinking Water Standard: In addition to maximum contaminant levels (MCLs) set by the EPA, states may set their own standards for drinking water that are stricter than the MCL. Of the ten contaminants currently listed on the Public Community Water System data portal, only uranium uses a Vermont Drinking Water Standard instead of a federal MCL.

ppb (parts per billion): One part substance per billion parts water, which is the same as µg/L (micrograms per liter)

ppm (parts per million): One part substance per million parts water, which is the same as mg/L (milligrams per liter)

pCi/L (picocuries per Liter): A picocurie (pCi) is a unit of measurement for radionuclides that measures the number of radioactive decays per second. pCi/L is the number of picocuries per liter of drinking water. There is no equivalent "parts-per-[*million/billion*]" unit to describe radioactive decay. This is the unit of health interest for radium in water.

Contaminant Descriptions:

Arsenic

Arsenic is a natural element found in some rocks and soils in Vermont. It is odorless and tasteless. Arsenic can enter drinking water supplies either from natural deposits in the earth or

from agricultural and industrial practices. People who drink water contaminated with arsenic over long periods of time may have an increased risk of developing bladder, lung, and skin cancer. Research is also ongoing on arsenic's links to cardiovascular disease, adverse neurological effects, diabetes, and other cancers. The current maximum contaminant level (MCL) for arsenic in drinking water is 10 micrograms per liter (µg/L), which is equal to 10 parts per billion (ppb).

Atrazine

Atrazine is an herbicide that is widely to control broadleaf and grassy weeds. People who drink water that contains high levels of atrazine over many years may have an increased risk of cardiovascular problems and reproductive difficulties. The current maximum contaminant level (MCL) for atrazine is 3 micrograms per liter (µg/L), which is equal to 3 parts per billion (ppb).

Di(2-ethylhexyl) phthalate (DEHP)

Di(2-ethylhexyl) phthalate (DEHP) is the most commonly used of a group of related chemicals called phthalates or phthalic acid esters. The greatest use of DEHP is as a plasticizer (softener) for polyvinylchloride (PVC) and other polymers including rubber, cellulose and styrene. A number of packaging materials and tubings used in the production of foods and beverages are PVC contaminated with phthalic acid esters, primarily DEHP. Some people who drink water containing DEHP in excess of the maximum contaminant level (MCL) over many years may have increased risks of liver problems, reproductive difficulties, and cancer. The current MCL for DEHP in drinking water is 6 micrograms per liter (µg/L), which is equal to 6 parts per billion (ppb).

Haloacetic Acids (HAA5)

Haloacetic acids (HAA5) occur in drinking water when naturally occurring organic material in the water reacts with chlorine or chloramine, which are used to disinfect the water. Some people who drink water containing total haloacetic acids in excess of the maximum contaminant level (MCL) over many years could experience an increased risk of cancer. The current MCL for HAA5 is 60 micrograms per liter (µg/L), which is equal to 60 parts per billion (ppb).

Nitrate

Nitrate exists naturally in water. There are two health concerns when drinking water with high levels of nitrate. The first health concern is with young infants being put at risk of "blue baby syndrome" (also called methemoglobinemia). Infant poisonings can occur when infants drink formula made with nitrate-contaminated tap water. The second health concern with nitrates in drinking water is the formation of chemicals called nitrosamines in the digestive tract.

Nitrosamines are currently being studied for their links to cancer. The current maximum contaminant level (MCL) for nitrate in drinking water is 10 milligrams per liter (mg/L), which is equal to 10 parts per million (ppm).

Radium

Radium is a naturally occurring radioactive metal. It's most common isotopes (atomic forms) are radium-226, radium-224, and radium-228. Radium occurs at low levels in many environmental samples, especially in rocks, soils, and water. A person who drinks water that contains high levels of radium over many years may experience an increased risk of aplastic anemia as well as cancers, including leukemia, bone cancer, and lymphoma. The current maximum contaminant level (MCL) for radium in drinking water is 5 picoCuries per Liter (5 pCi/L).

Tetrachloroethylene (PCE)

Tetrachloroethylene (PCE) is a solvent used in the textile industry and as a component of aerosol dry-cleaning products. It can enter water systems through discharges from factories and dry-cleaning facilities. People who drink water with high levels of PCE over many years may have an increased risk of liver problems and cancer. The current maximum contaminant level (MCL) for PCE is 5 micrograms per liter (µg/L), which is equal to 5 parts per billion (ppb).

Trichloroethylene (TCE)

Trichloroethylene (TCE) is a solvent that is primarily used to remove grease from fabricated metal parts and is also used in the production of some textiles. People who drink water that contains high levels of TCE for many years may experience increased risk of liver problems and cancer. The current maximum contaminant level (MCL) for TCE is 5 micrograms per liter (µg/L), which is equal to 5 parts per billion (ppb).

Total Trihalomethanes (TTHM)

Total Trihalomethanes (TTHM) occur in drinking water when naturally occurring organic material in the water reacts with chlorine or chloramine, which are used to disinfect the water. Some people who drink water containing TTHM in excess of the maximum contaminant level (MCL) over years may experience an increased risk of liver, kidney, and central nervous system problems, as well as an increased risk of cancer. The current MCL for TTHM is 80 micrograms per liter (µg/L), which is equal to 80 parts per billion (ppb).

Uranium

Uranium is a naturally occurring radioactive element. Uranium breaks down (decays) very slowly into other elements, including radium and radon gas. Drinking water may contain uranium in areas where it is present in the rocks and soil. A person who drinks water that contains high levels of uranium over long periods may have increased risks of kidney damage and cancer. The current Vermont Drinking Water Standard for uranium is 20 micrograms per liter (µg/L), which is equal to 20 parts per billion (ppb).

More Information

For more information on the contaminants selected by the National Environmental Public Health Tracking Program, including references to academic journal articles on their health effects, please visit the CDC's National Environmental Public Health Tracking webpage at this link: **http://ephtracking.cdc.gov/showIndicatorPages.action**, and select "Community Water" in the upper drop-down menu, followed by the contaminant which you would like information for.